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Relating Decision Making Styles, Depressive Symptoms, and Induced Mood to Risk Aversion

A Senior Honors Thesis

Presented in Partial Fulfillment of the Requirements for graduation

with research distinction in Psychology in the undergraduate

colleges of The Ohio State University

by

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May 2011

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Abstract

Depression is associated with decisions to withdraw from ones environment, and to avoid potentially rewarding situations. Currently, little research has examined the decision-making styles of depressed individuals. We investigated the relationships among depressive symptoms, decision-making styles, induced mood and the impact that each has on risk-aversion in hypothetical decisions made for the self and an unknown "other". Two hundred and forty undergraduates completed a survey packet which included our various depression and decision making measures. Results revealed that a positive interaction between the regret based style and symptom level was the only predictor of risk-averse choices made for the self ($p=.017$), and the analytical style was the only predictor of risk averse choices made for others ($p=.009$). Additional findings showed participants to be more risk averse for others than for themselves in higher risk situations, but more risk-seeking for others in low risk situations. Implications and future directions are discussed.

Relating Decision Making Styles, Depressive Symptoms, and Induced Mood to Risk Aversion

When most individuals are about to make an important decision, they first spend some time thinking about the options involved. Yet different people might weigh certain thoughts more heavily than others. For example, when deciding between two job offers, one person, Ashley, may look up as much information as she can find, and compare the pros and cons of each job, in a highly analytical fashion. Another person, Ian, might simply have a certain gut-feeling about one job that he does not have about the other, and would therefore go with the job that he intuitively knew was best for him. Even still, a third person, Rita, might ask herself which she would be least likely to feel bad about choosing later on. She would come to her final decision based on the idea that the job she chooses is less likely to cause her to regret her decision in the long run. Whether individuals invoke an analytical, intuitive, regret-based, or even combined decision-making style is not necessarily indicative of which option they will choose in any given situation. However, the decision-making styles that people use do clue us in to the type of information that is most salient to different kinds of decision makers.

Although research in the field of judgment and decision making has not been able to definitively claim one way of making decisions is best, past research has shown that decision making style is a relatively stable characteristic, even when the same person makes two very different decisions in a short period of time (Nygren, 2000). By examining the ways different personality traits (Nygren, 2000), as well as moods (Raghunathan & Corfman, 2004; Raghunathan & Pham, 1999) are related to the decisions an individual makes, past researchers have paved the way to investigate the impacts that other characteristics may have on decision making.

Interestingly, depression, an issue that affects people on a more global level, has received little attention in its effects on the decisions that individuals make. The depression literature, specifically the ideas of Aaron Beck, suggests that individuals living with depression engage in different kinds of negative thinking. This negative thinking develops into a maladaptive attitude, one that in severely depressed individuals interferes with nearly all of their thoughts (Beck, 1979). Other notable symptoms of depression include loss of interest in activities, insomnia or hypersomnia, feelings of worthlessness or guilt, and lack of concentration or indecisiveness (APA, 2000). Because the symptoms of negative thinking, loss of interest in activities, guilt, as well as indecisiveness are highly related to decision making, it makes sense that when these symptoms present simultaneously, a certain "depressive" pattern of decision making may emerge.

Despite the multitude of research that has been done in the three independent areas of a) decision making styles, b) the impact of emotions on decision making, and c) depression, few researchers have investigated their interactions. The purpose of our study was to do exactly that. In this study, we addressed two highly related questions. First, we asked if individuals who score higher on assessments of depressive characteristics are more likely than other participants to endorse a regret-based decision making style. Secondly, given that there has been in other studies, and was expected in this one as well, a correlation between these two measures, we asked how the combination of depressive symptoms and the endorsement of the regret-based decision style affected the decisions made by our sample. In addition to these questions, we also sought to discover if the induction of a sad-mood had the same risk-enhancing effects on individuals in our sample as past literature suggests it had on "average" participants.

Decision Making Styles

Prior to launching into an investigation of how mood and depression may interact with decision-making style, it is important to grasp what exactly we mean by decision-making style. In Nygren's (2000) work he outlines the development of the three subscales of the Decision-Making Inventory (DMI). From a larger sample of items, Nygren ran a series of factor analyses from which he discovered that three separate types of statements consistently loaded together. He noted that these types of statements suggested three different styles of decision making: analytical (ANA), intuitive (INT), and regret-based (REG). Each style is now represented by 15 statements on the 45 item DMI.

Recall from the example explained in the opening that the three individuals described all used different methods to choose between two jobs; each method describes the basic tenants of each of the decision making styles. Analytical Ashley used an information seeking approach to compare all the facts surrounding either job. The ANA style has statistically significant negative correlations with such personality traits as depression, impulsivity, risk-seeking behavior, and causal uncertainty (Nygren & White, 2001). Intuitive Ian went more with his gut feelings, picking the job that just felt right to him. The INT style has statistically significant positive correlations with need for cognition, faith in intuition, risk-seeking behavior, and impulsivity, as well as a significant negative correlation with depression (Nygren & White, 2001). Then there was Regret-Based Rita, who made her decision by picking the job that she thought she would feel the least bad about. The REG style is statistically significantly correlated with harm-avoidance, self-doubt, anxiety, depression and causal uncertainty. The REG style is negatively correlated with need for cognition, faith in intuition, risk-seeking behavior, and impulsivity (Nygren & White, 2001).Given the correlations between DMI styles and other personality factors, endorsement of one DMI style over the others (the styles are not mutually

exclusive), highlights the information that a particular individual likely sees as pertinent to the decision at hand.

The Role of Emotions in Decision Making

One issue that has been long standing in the research is the impact that an individual's emotional state has on the decisions he makes. Previous studies have found that when an individual makes a decision in a particular mood, he may use mood repair strategies to influence his emotional state. (Morris & Reilly, 1987; Zillmann,1988). This strategy is most notably employed by participants in Forgas' (1991) study, in which participants in either a sad or neutral mood chose a partner for a strategic task based on evidence about the partner's interpersonal skills, and their abilities in the task. Forgas found that participants in the sad mood condition were more likely to choose to work with a partner with good interpersonal skills, who was described as kind, than they were to choose a partner who would be skilled at the task. From this finding he concluded that mood-repair occurs when participants in sad moods have an opportunity to improve that mood, in this case by working with a pleasant partner (Forgas, 1991).

Following Forgas' finding on the use of mood repair strategies to escape negative moods, researchers Raghunathan and Pham (1999) sought to discover differences in decision making displayed by individuals with two distinct negative moods: induced sadness or induced anxiety. Their work had a very formative impact on the current research, as we too looked for these differences among participants in different mood conditions.

In the Raghunathan and Pham (1999) study, the researchers first induced undergraduate students with either a neutral, anxious, or sad mood, by asking participants to read and relate to hypothetical situations (a popular mood manipulation technique). In the first study, after undergoing mood manipulation for their target mood (either neutral, sad, or anxious),

participants were asked to rate their preference for either a “high risk/ high reward” gamble (where the chances of winning are low but the amount to be won is high) or a “low risk/ low reward” gamble (where the chances of winning are high but the amount to be won is low). As the authors predicted, the participants in the sad mood condition showed a preference for the higher risk/ higher reward gamble. This preference followed the mood repair strategy of finding the “missing reward” associated with sadness. Also, as predicted, those in the anxious mood showed a preference for the lower risk/ lower reward gamble, perhaps as a means to reduce anxiety. They found that participants in the neutral mood had preferences in between these two extremes (Raghunathan & Pham, 1999).

Raghunathan and Pham (1999) also conducted a second experiment in this study, using the same techniques from the first experiment but in a field unrelated to gambling. In Study 2, the researchers induced emotion through the same mechanism, but then went on to have participants rate their preferences for either a “high risk/ high reward” job opportunity (which had low job security but paid very well) or a “low risk/ low reward” job opportunity (which had high job security, but did not have nearly as strong of a salary). Again the results showed that the participants in the sad mood were most likely to prefer the high risk/ high reward situation, while the anxious participants were most likely to prefer the low risk/ low reward situation, and the neutral participants once again fell in the middle.

A third experiment conducted as part of Raghunathan and Pham’s 1999 study replicated Study 1, but had participants make decisions for themselves and another individual. This manipulation was used to try to understand the mechanism related to the preference differences in sad and anxious individuals. Raghunathan and Pham offered two hypothesizes related to the reason for these differences. Either, (1) induced mood simply biased the participants’ decisions (which should have resulted in them making the same decisions for themselves and the other) or

(2) they took into account their mood and the way that specific outcomes would affect it. Importantly, results from this experiment showed that in the self condition preferences for risk highly resembled those found in Study 1. However, in the "other" condition, no such differences in preferences were found, leading the researchers to believe that participants were paying attention to the way different outcomes would impact their mood.

Overall, Raghunathan and Pham demonstrated that mood can impact decisions. They found that individuals in an induced sad mood will be more risk-seeking while those in an induced anxious mood will be less risk-seeking. Additionally, they claimed that these risk related preferences likely stemmed from a drive to reduce the participants' own sadness, or anxiety, as is suggested by mood repair strategy (Raghunathan & Pham, 1999).

In a follow-up study, Raghunathan and Corfman (2004) tested pleasure-seeking, in addition to risk-seeking, and found similar results. In this study, participants were again randomized into sad, anxious, or neutral mood induction conditions. However, rather than having participants choose between low/high, risk/reward scenarios, they were told that they would need to complete two tasks in the next two weeks (an enjoyable task and a necessary task) and were asked which they would like to complete first. Though the majority of participants had an overall preference for the enjoyable task, results showed that those in the anxious mood were more likely than those in the sad or neutral moods to choose to do the necessary task first (hypothesized to reduce anxiety). On the other hand, those in the sad mood were more likely to choose to do the enjoyable task first (hypothesized to reduce sadness). These results seem to indicate that when mood is temporary, participants may take action in order to alter a negative mood.

Impact of Depression and Other Trait Emotions on Risk-Taking

Although these studies have shown the way different temporary or state emotions impact decisions, participants were unselected and, as such, represent a non-depressed sample. Do these patterns for state-sadness hold true for depression, which as mentioned earlier typically lasts for a more extended period of time and is marked by decreased interest in pleasurable activities? This question was tackled recently and the findings largely suggest they do not. In one study researchers had depressed and control participants complete the Iowa Gambling Task (Smoski et al., 2008).

In the Iowa Gambling Task (IGT), participants play a card game to try to win as much virtual money as possible. Participants win when they pick "good" cards, and though they do not know before starting the game, some decks have more "good" cards than others, and some decks have "bad" cards which cause them to lose money. Thus, the game really tests how participants react to negative feedback, and in so doing, attempt to maximize the amount of virtual money they make. Although it can be said that the IGT is different from the risk-preference situations tested in other decision-making studies (i.e., Raghunathan & Pham, 1999), in that it actually measures decisions based on feedback rather than simple hypothetical preferences, the Smoski et al. (2008) study is the most relatable study that specifically looked at the impact of depression on decisions. During this study, depressed participants did better than controls in terms of their overall score, a result which was interpreted as high sensitivity to negative feedback demonstrated by the depressive group. This finding suggests that depression, and perhaps the associated mood of chronic sadness, may have a very different impact on decision making processes than induced sadness does.

The finding made by Smoski and colleagues (2008), is in line with those made in an earlier study, in which Lerner and Keltner (2001) investigated the impact of other long lasting, trait emotions (anger and fear) on decision making. In this study, Lerner and Keltner found that

these trait emotions did have an impact on non-related decisions. This impact was seen when fearful participants evidenced more risk aversion and angry participants showed more risk-seeking attitudes. The results of the Lerner and Keltner study however, show relationships related to mood repair strategy (Forgas, 1991), whereas the results of the Smoski et al. study did not show participants taking more risks to reduce their sadness (though again depression is not simply sadness), the way that mood repair strategy seems to suggest they would.

The Current Study

To get a better sense of the combined effects of the previous literature, we revisit the example of Ashley, Ian, and Rita. Research on the Decision-Making Styles Inventory shows that the majority of people apply a specific style (ANA, INT, REG) to the decision-making process as a whole, and use that style stably across decisions (Nygren, 2000). Thus, while Ashley weighs pros and cons, Ian goes with his gut feelings, and Rita seeks to avoid regret. Although decision-making style shows us what information individuals weigh most heavily when making a decision, it doesn't say much about the role of mood states. Yet the findings of research on the impact of mood in an unselected sample can easily coexist with decision making style research. After all, if Ashley were sad at the time she was considering the costs and benefits of either job, surely a good analytical question would be "which job is more rewarding?" Similarly, if Ian were in an anxious mood, he might have a "better feeling" about the job that could reduce his anxiety. Since ANA and INT styles seem to be more widely held than REG styles in a general population it's easy to see how these two theories of decision-making can be combined.

Yet the results of the depression research seem to indicate that individuals with depression do not engage in typical mood-repair strategies, showing that depression differs from sadness in the way that it may impact decision making. After all, depressed participants were

found to take fewer risks in the IGT than their non-depressed counterparts (Smoski et al, 2008), even though research on the role of mood suggests that in order to alleviate sadness, participants in an induced sad condition take more risks (Raghunathan & Pham, 1999). This contradiction suggests that people in sad moods make different decisions than those in depressed moods. Because prolonged sadness is a symptom of depression, perhaps the decision making process is affected by simply the chronicity of mood; where sad people may make higher risk decisions in attempts to elevate their mood, but depressed people do not think such tactics will work. Another possibility, however, is that in the pattern of differences that puts individuals at risk for depression (negative thinking, loss of interest in activities, guilt, as well as indecisiveness), is an overriding decision making style that causes these individuals to be more risk averse. In the current study, we related the decision making styles to symptoms of depression as well as induced mood, and discovered how these traits came into play in preferences for risk and reward in different decision making tasks.

Methods

Participants

We recruited a total of 240 participants for this correlational study. Participants were students participating in the Research Experience Program (REP), which consists of introductory psychology students at The Ohio State University. All of our participants were at least 18 years of age, and all received partial class credit for their participation.

Participant Characteristics

The average age of our participants was 19 (*SD= 2.53*, range = 18- 40). The majority of participants in the sample were female (57.1%). We also asked all participants about their college major and in our sample 55 different majors were represented, yet the most common

response to our question (N= 37) was that students had not yet chosen a major (wrote "undecided" or "don't know").

Materials

CES-D: Center for Epidemiological Studies Depression Scale (Radloff, 1977)

The CES-D is a self-report scale of depressive symptoms, and was created specifically for research purposes (see Appendix A). We used the 20 item CES-D, in which participants are to circle the number (0-3) that corresponds with how often in the past week they felt they could relate to each statement. Total scores can range from 0-60 where scores of less than 15 indicate very low depressive symptoms, and scores above 30 indicate moderate to severe symptoms of depression. Previous research has found that a cutoff of ≥16 suggests significant clinical symptoms of depression (Pandya et al., 2005). Both the reliability and validity of this scale have been demonstrated (McDowell & Newell, 1996; Radloff, 1977). The CES-D is one of many assessment tools used for research on depression and depressive symptoms and information solely from this inventory is not enough to diagnose depression. In this study the CES-D was only used as a tool to compare groups with differing levels of symptoms.

DMI: Decision Making Inventory (Nygren, 2000)

The DMI is a self-report scale that classifies decision making style on three separate sub-scales (see Appendix B). The sub-scales are Analytical (ANA, which describes a style of seeking out information and comparing alternatives), Intuitive (INT, which describes a style of going with "gut-instincts" and using quick heuristics) and Regret-Based (REG, which describes a style of seeking to avoid potential regret or feelings of loss). The scales are not mutually exclusive; therefore, it is possible for a participant to endorse two or even all three scales simultaneously. Both the validity and reliability of this scale have been substantiated through past studies (cf. Nygren & White, 2001). We used the 45-item version of the DMI, in which

participants are asked to rank statements about their decision making processes on a 1(strongly disagree) through 6 (strongly agree) Likert-type scale. Higher scores on one of the three subscales indicate a particular style of making decisions; high scores on two or all three scales indicates a mixed style of decision making.

Mood Induction Mechanisms (Raghunathan & Pham, 1999)

In order to induce either a sad or neutral mood in participants, we included in their survey packet both a cover story about testing ability to empathize with another person, and a five paragraph story about another undergraduate (see Appendix C). We used the same mechanism to induce mood that was used in Raghunathan and Pham (1999) as well as Raghunathan and Corfman (2004), which was provided to us through personal communication with Michel Tuan Pham. The cover story explained that participants should read the short story slowly and carefully, while trying to imagine themselves in the story.

The sadness induction story is written in the second-person and asks the participant to imagine himself/herself in a situation where two weeks before finals, he/she receives a call from home explaining some bad news about his/her mother. The student goes home immediately to find his/her mother very ill in the hospital. While the student is visiting his/her mother with the rest of his/her relatives, the mother dies.

The neutral mood induction story is also written in the second-person, and asks the participant to imagine himself/herself in a situation where he/she runs into some old friends, and describes a very typical day out with friends. They go to a bar, and then a movie, and nothing out of the ordinary happens. Then the student goes home, but before leaving makes plans to meet up with his/her old friends again soon. Although it is easy to conceive of this neutral story as more positive than neutral, it was used as the “neutral” condition in the previous studies

mentioned. Thus in order to compare our findings with those found in the past, we thought it best to use the exact same mood induction mechanisms.

Both the neutral and sad mood induction stories were pretested by Raghunathan and Pham (1999), and proved effective at causing a temporary mood change that did not harm participants in anyway. We used these mood induction stories because they have been shown both reliable and valid through their employment in other studies (Raghunathan & Corfman, 2004; Raghunathan & Pham, 1999).

Hypothetical Decision Questionnaire

In addition to these widely used and proven scales and induction mechanism, we also employed a new questionnaire that we developed for this study (see Appendix D). The questionnaire contains five hypothetical decision making scenarios.

This questionnaire included the two (gambling and job) situations used in Raghunathan and Pham 1999 (provided to us through personal communication with Michel Tuan Pham). It also included three situations that we created for this study: a situation involving a choice in applying to different undergraduate programs, a traffic decision situation, and a situation about choosing whom to ask on a date.

In each scenario, participants were presented with two options (one high risk/ high reward option and one low risk/ low reward option) and asked to rate their preference on a 1 (definitely prefer option A) to 6 (definitely prefer option B) scale. The situations were counterbalanced so that in two situations choice A was the low risk/ low reward option, and in three situations choice B was the low risk/ low reward option. The situations were also randomized into five different orders so that we could test if any order effect existed. In addition to rating their preferences on the 1-6 scale, we also asked participants to make a choice between the two options (A or B) given in each situation. While choice between the options

served as a discrete measure of risk averse (preference for the low risk/low reward options) or risk acceptant (preference for the high risk/high reward options) tendencies, preference on the rating scale served as an indication of strength of that tendency.

As part of the questionnaire, each participant was also asked to make a decision for another individual in each scenario, though it was stressed that this decision would not personally affect the participant in anyway. This additional question was included in this study, as it was in Raghunathan and Pham's (1999) study, to help us in understanding the mechanism that underlies each decision.

Procedure

We recruited participants for this study on the REP website, where students are able to choose from a number of different studies. When participants signed up, they were randomly assigned to either the neutral or sad mood condition.

This study was conducted in multiple sessions throughout the Autumn (2010) and Winter (2011) quarters. The experimenter provided each participant with a written copy of the verbal script and contact information for all the researchers involved with this study. The experimenter also read the verbal script to the participants, and after receiving verbal consent, handed out a survey packet, which she asked each participant to fill out. This packet included the CES-D, DMI, the cover story and instructions for the "empathy task", the randomly assigned mood induction story, a short empathy inventory (to add credibility to the mood induction task), and the 5 randomly ordered hypothetical decision scenarios.

Upon completion of the questionnaire, the experimenter gave participants a written debriefing form, as well as information about depression and campus counseling services. The experimenter also thanked participants for their time and asked them to contact the research team with any questions they had after leaving the study.

Results

Descriptives

Data were considered incomplete and were thrown out if a participant failed to answer three or more items on any independent scale. If participants did not answer only one or two questions on a scale, the missing data were filled in by calculating an average scale score based upon other items of that scale. Only two participants were found to have incomplete data on any of the scales (the CES-D and one of the hypothetical situations), and therefore these participant's data were not used in the analyses of these particular scales. Thus analyses of the CES-D and risk-scores are based on a sample of 239 participants; all other analyses are based on a sample of 240 participants.

In analyzing our data we first explored general descriptive information of the total sample on our variables of interest (see Table 1 for complete descriptive information on all variables). The distribution of CES-D was, as expected, positively skewed with a mean score of 12.96 (*SD=8.30*, range = 0- 42), a median of 12, and a mode of 4. The distribution of scores on the REG scale of the DMI was fairly symmetric with a mean of 61.08 (*SD=12.28*, range 24-88), a median of 61, and a mode of 59.

A risk aversion score was calculated based upon the total number of risk-averse preference choices that participants made across the five hypothetical situations. Thus a score of 0 indicates that the participant always chose the high risk/ high reward option, and a score of 5 indicates that the participant always chose the low risk/ low reward option. These scores were calculated when the participants were making choices for themselves (Self) and for an unknown other (Other). The mean risk-averse score in the Self condition was 2.15 (*SD=1.15*, range 0-5) with a median of 2.00 and a mode of 2. The mean risk-averse score in the Other condition was 2.96 (*SD=1.16*, range 0-5) with a median of 3.00 and a mode of 3.

In total, 115 of our participants were exposed to the neutral mood induction story, and 125 were exposed to the sad mood induction story.

Data Analysis

We had four main hypotheses in this study. First, based upon past findings (Nygren & White, 2001), we predicted that in our sample REG style would be positively correlated with CES-D score. To test this hypothesis, we performed a simple bivariate correlation of the two scales. A Pearson correlation between participants' CES-D and REG scores produced a correlation of r=.285, which was significant at α= .01 (for a complete list of all correlations see Table 2).

In addition to finding the correlation between CES-D score and REG score, we also wanted to see if individuals who endorsed (i.e., scored highest on) the REG scale were more likely than those who endorsed the INT or ANA scales to score higher on the CES-D. In order to test this related idea, we first divided our participants into groups based on which of the three decision making styles they scored highest on (although possible, no participant scored exactly the same on any two scales). After doing so, we found that the mean CES-D for those endorsing the REG style (n= 63) was 17.17 *(SD= 9.33)*, but was only 10.80 *(SD=6.69)* for the INT style (n=40), and 11.64 *(SD= 7.55)* for the ANA style (n= 136). In order to test if these differences in means were statistically significant, we compared each style to the others through multiple independent samples t-tests. In the comparison between the ANA and REG styles, the result of the t-test was significant ($t(197) = 4.12$, $p < .001$). The estimate of Cohen's *d* was 0.82. In the comparison between the INT and REG styles, the result of the t-test was again significant ($t(101) = 3.75$, $p < .001$) with a Cohen's *d* estimate of 0.75. However, in the comparison between the ANA and INT styles, the result of the t-test was not significant ($t(174)= 0.677$, $p > .10$) with a Cohen's *d* estimate of 0.16. Thus we concluded that participants who endorsed the REG style,

had significantly higher scores on the CES-D than those who endorsed either other style, and therefore exhibited a greater number of depressive symptoms than other participants (see Figure 1).

Because we did find a relationship between CES-D score and REG score, we next tested our second hypothesis that depressive symptoms and endorsement of the REG style of the DMI would both be predictive of heightened levels of risk aversion in decisions made for the self. We based this hypothesis on the findings that depression is associated with risk aversion and feelings of regret (Beck 1979; Smoski et. al 2008).

To test this hypothesis, we regressed number of risk averse preferences on the predictor variables of CES-D scores, REG scores, and the interaction of standardized CES-D x REG scores (we included all other variables as well in a stepwise fashion). The overall regression was not significant nor was either REG score or CES-D score when separated. However, the interaction of CES-D score x REG score was found to be a significant predictor, producing a correlation of .154 between the variables (r^2 = .024) and a regression equation slope of .14, (F (1,236) = 5.752, p= 0.017; see Figure 2). Thus we concluded that in our sample the interaction of CES-D score and REG score could partially predict risk-aversion for the self.

In a related hypothesis, we believed that the combination of CES-D and REG scores would also be related to higher scores of risk-aversion for an unknown other, given that in the depression literature the symptoms relating to risk aversion and regret were described as global, affecting all parts of the individual's life (Beck 1979; Smoski et al. 2008).

To test this hypothesis, we regressed number of risk averse preferences on the predictor variables of CES-D scores, REG scores, and the interaction of standardized CES-D x REG scores (we also included all other variables in a stepwise manner). The overall regression was not significant nor was REG score, CES-D score, or the interaction of these two. However, and

to our initial surprise, ANA score was found to be the only significant predictor of risk aversion on behalf of an unknown other, producing a correlation of 0.169 between the variables (r^2= .028) and a regression slope of .019, (F (1,237) =6.95, p=.009; see Figure 3). Thus we concluded that in our sample ANA score was able to partially predict risk aversion in decisions made for others.

Additionally, we hypothesized that we would find a mood effect, so that those in the sad condition would be more risk-seeking than those in the neutral condition, as was found by Raghunathan and Pham (1999).

In order to test this hypothesis we conducted an independent samples t-test. The comparison of means did not support our hypothesis, showing no significant difference in risk aversion score between the two groups. The mean Self risk-averse score for participants in the neutral mood condition was 2.03 (*SD= 1.17*), and in the sad mood condition it was 2.26 (*SD = 1.13)*. The results of the independent samples t-test showed this difference to be non-significant (t(237) = -1.504, p = .134). The estimate of Cohen's d was -0.19, indicating that mood condition had no significant effect on risk preferences made for the self.

Lastly we hypothesized, based on the findings that mood effects only impacted decisions made for the self in the ways predicted (Raghunathan & Pham, 1999), that there would be no significant differences between the number of risk averse choices made for the "unknown other" in either mood condition. Although based upon the findings stated above we knew that a non-significant difference in choices made for the other would not affirm Raghunathan and Pham's explanation that participants actually consider the effects that choices will have on themselves but not others, we wanted to see if there were significant differences between groups when deciding for the other. To test this, we conducted an independent samples *t*-test. The mean Other risk-averse score for participants in the neutral mood condition was 3.02 (*SD= 1.12)* and

for participants in the sad mood condition it was 2.90 (*SD = 1.21)*. As expected, a *t*-test comparing the groups indicated the difference to be non-significant (t (237) = .758, $p > .10$). The estimate of Cohen's *d* was 0.10, indicating that mood condition had no significant effect on risk preferences made for an "unknown other". Figure 4 shows the comparison of mean risk-averse score in sad and neutral condition when deciding for self and for the unknown other.

Unexpected Findings

Although we had not initially set out to explore the differences in risk-aversion that participants express when making choices for themselves as opposed to another individual whom they do not know, the strength of these surprise findings warrants their discussion. Since the interaction of REG style and CES-D were predictive of risk-aversion in choices made for the self but not others, but ANA style was predictive of risk-aversion in choices made for others but not the self, we began to wonder if strong endorsement of a particular DMI style was related to the way that participants made different choices for themselves and the unknown other.

To test this idea, we used McNemar's test for significance of change to discover if the likelihood of individuals switching from risk-averse to risky vs. risky to risk-averse was the same when the decision was being made for either the self or an unknown other. We divided participants based upon DMI style to see if a pattern existed for all participants or only for those endorsing a particular style. Using McNemar's test, we found a significant general tendency for participants to overwhelmingly change their choices from risky for themselves to risk-averse for others ($p<.001$) in the job, school, and traffic situations. These tendencies were shown by participants regardless of their DMI style endorsement, yet decreased in strength from ANA to REG to INT endorsement.

Interestingly, in the gamble scenario these tendencies were reversed. Once again, using McNemar's test we found a significant general tendency for participants to change their

choices. But in these situations they switched from risk-averse for themselves to risky for others (p = .013). These tendencies were shown by participants regardless of their DMI style endorsement (though not at statistically significant levels when divided up into the respective three groups). The strength of this tendency decreased in strength from INT to ANA to REG endorsement (see Table 3 for complete list of preference changes by situation).

Though initially surprising, these data seem to confirm the idea in the literature that when participants are making decisions in situations that have a low impact on another individual's life (such as a possible $10 over a probable $5), they are more risky than they would be for themselves (Beisswanger, Stone, Happ, & Allgaier 2003; Chakravarty, Harrison, Haruvy, & Rutstrom, 2010). However, when participants made decisions that had a greater impact on the individual's life, these differences seemed to disappear in past studies. Our finding seems to show that rather than disappear, when deciding about situations that have a great impact on another individual's life, these tendencies are actually reversed and participants became more risk-averse for others than they were for themselves.

Discussion and Conclusions

Over the course of this study, we found support for two of our hypotheses, as well as some intriguing results that we had not anticipated.

First of all, the positive correlation between REG score and CES-D score and the higher average CES-D score of endorsers of the REG style in this study supported our major hypothesis that people with higher levels of depressive symptoms put more weight on the factors they might regret when making a decision. This is not surprising given that many of the major symptoms of depression relate directly to decision making, including negative thinking, loss of interest in activities, guilt, and indecisiveness, as well a heightened response to negative feedback (Beck 1979; Smoski et al. 2008). The participants in our study who had higher levels

of depressive symptoms were more likely to recall the negative effects that bad decisions have and could have on them as captured by their endorsement of the REG scale. Just like Rita in the opening example, these participants seemed to focus in on details of decisions that they would potentially regret later, and reported a propensity to make decisions based off of that information.

With that in mind, our second hypothesis tested the idea that participants who endorsed the REG style and had high scores on the CES-D would be more risk-averse when making decisions for themselves. We found some support for this hypothesis when, through a multiple regression, we saw that the positive interaction between CES-D and REG scores was the only variable that was able to predict risk-aversion scores. Thus we concluded that, to a degree, participants who seek to avoid not only regret but also negative feedback are more likely to avoid making risky choices. They likely put more weight on the possible negative outcomes of these options, and as such interpret them as not worth the risk.

We also hypothesized that Regret score and CES-D score would be predictive of risk aversion in decisions made for the unknown other. However, we were surprised to find that the only variable that was predictive of risk aversion in this condition was the Analytical score. In retrospect, it makes sense that participants who make their decisions through an analytical process may have felt that they did not have sufficient information to make a decision for someone else and thus defaulted to the "safer" option. Given that Analytical score was not predictive of risk-aversion when participants made decisions for themselves, it seems likely that participants considered their personal strengths, weaknesses, and overall situation before deciding in which situations they would be more willing to take risks. This idea was expressed by one participant who actually wrote in the margin of her survey that she "didn't know their qualifications" when deciding to take the safe option for the unknown other in the school

situation. In future work we would like to test this idea by giving differing amounts of information about the unknown other, and also asking participants to write in reasons for making the decisions that they did.

For our final hypothesis, we predicted replication of Raghunathan and Pham's (1999) findings that participants exposed to the sad five paragraph story made more high risk/ reward choices when deciding for themselves. However, we found no support for this hypothesis. If we had been able to replicate, we would have seen that participants in the sad mood condition scored significantly lower on the measure of risk aversion when deciding for themselves, but a t-test indicated that there was no significant difference between the groups.

Additionally, we had anticipated that such a difference would not occur when participants were making decisions for the unknown other. Although we did find this to be the case, the fact that there was no difference in the self condition means that we were again unable to find support for the idea that this happened because people consider the way outcomes will impact only their own moods, as was suggested by Raghunathan and Pham (1999).

Given that we did not find any significant difference in risk aversion based on mood condition, we deem it possible that the mood manipulation did not work in our sample. Because previous research has suggested (Raghunathan & Corfman, 2004; Raghunathan & Pham 1999) that including a manipulation check often dampens the effect of the mood induction, we chose not to include a manipulation check in our study. In future work, we would like to design a covert manipulation check so that we are able to measure the effectiveness of the manipulation.

Although we had not made any predictions about the likelihood that participants would be more risk-averse when deciding for others than for themselves, we did find evidence that, in what we would consider riskier situations (job, school, traffic), this pattern occurred. We also found that in one of the lower risk situations (date) no such pattern was observed, and in the

other (gamble) the pattern was actually reversed. Although the finding that participants expressed less risk aversion for others in a low risk situation agrees with previous findings (Beisswanger et al., 2003; Chakravarty et al., 2010), the finding that participants expressed greater risk aversion for others in the higher risk situations has not yet been thoroughly explored in the literature. In future studies we would like to explore this topic by first getting a pre-rating of level of riskiness of different situations, and then having participants decide either for themselves or an unknown other.

Overall, in this study we had mixed results. Importantly though, we did find that participants who endorsed the Regret-Based decision style were more likely to have higher levels of depressive symptoms and that the relationship among these two variables was predictive of risk aversion. With that in consideration, future studies should test the way that learning and using a more analytical or intuitive approach of decision making impacts the level of depressive symptoms felt by participants over a period of time. If use of a different approach of decision making leads participants to take more risks and gain more rewards, it is possible that it could also play a role in symptom reduction. Such a finding has the potential to inform treatment, and with that in mind we believe our study is among the first of many small steps toward considering the way that human decision making processes might strengthen or reduce the impact that mental illness has on quality of life.

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Figure Captions

Figure 1: CES-D mean score by DMI style

Figure 2: Regression of risk-averse choices for self on predictor of CES-D X REG style

Figure 3: Regression of risk-averse choices for other on predictor of ANA style

Figure 4: Risk aversion for self and other by mood condition

Table 1: Descriptive information on all variables

Table 2: Correlations among variables

Table 3: Pattern of risk aversion by situation and DMI style in both self and other conditions

Appendix A: Center for Epidemiological Studies Depression Scale (CES-D)

Appendix B: Decision Making Inventory (DMI)

Appendix C: Mood Induction Mechanisms

Appendix D: Hypothetical Decision Questionnaire

Figure 1

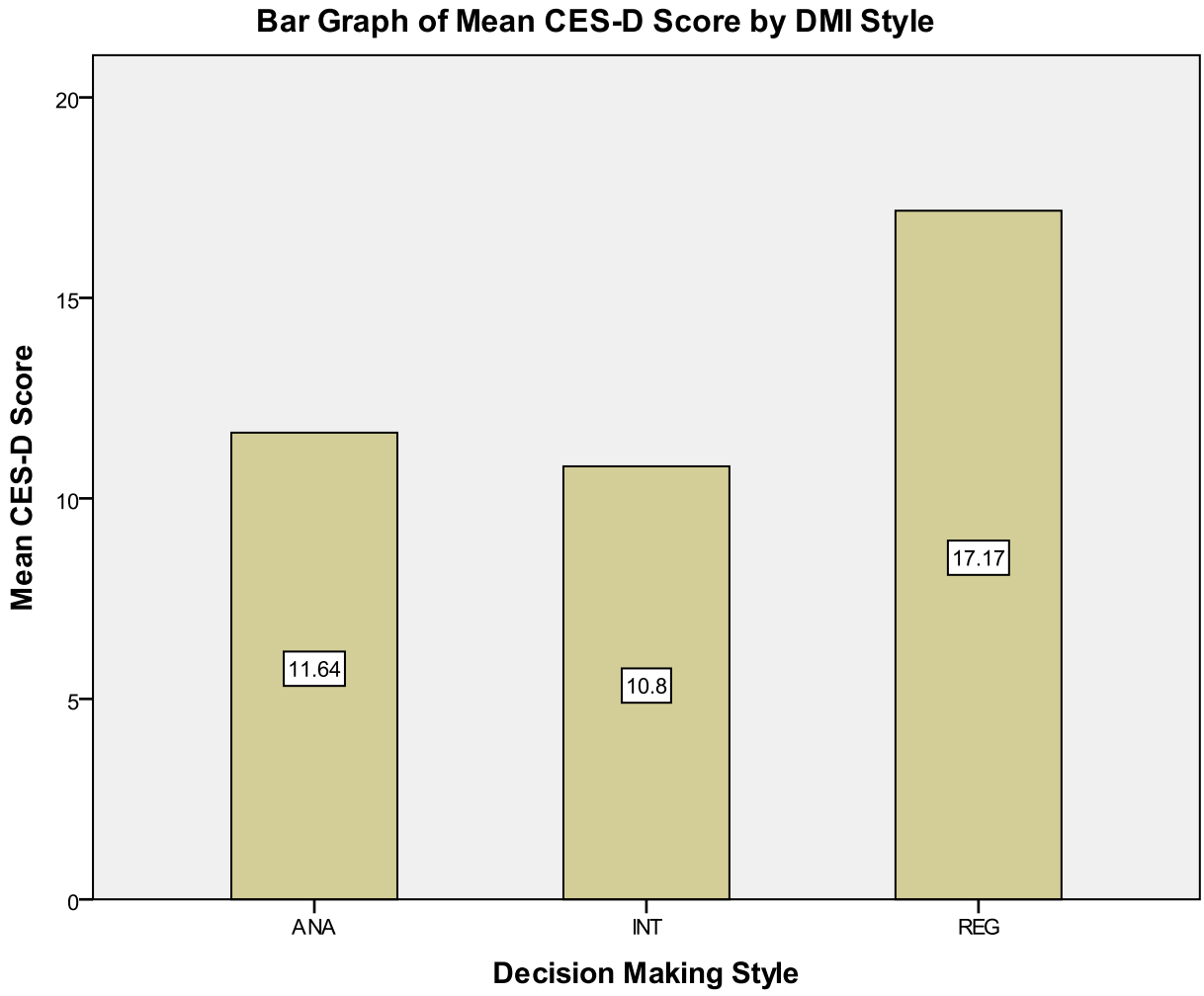
Bar Graph of Mean CES-D Score by DMI Style
Mean CES-D Score
20
15
10
5
0
11.64
10.8
17.17
ANA
INT
REG
Decision Making Style

Figure 2

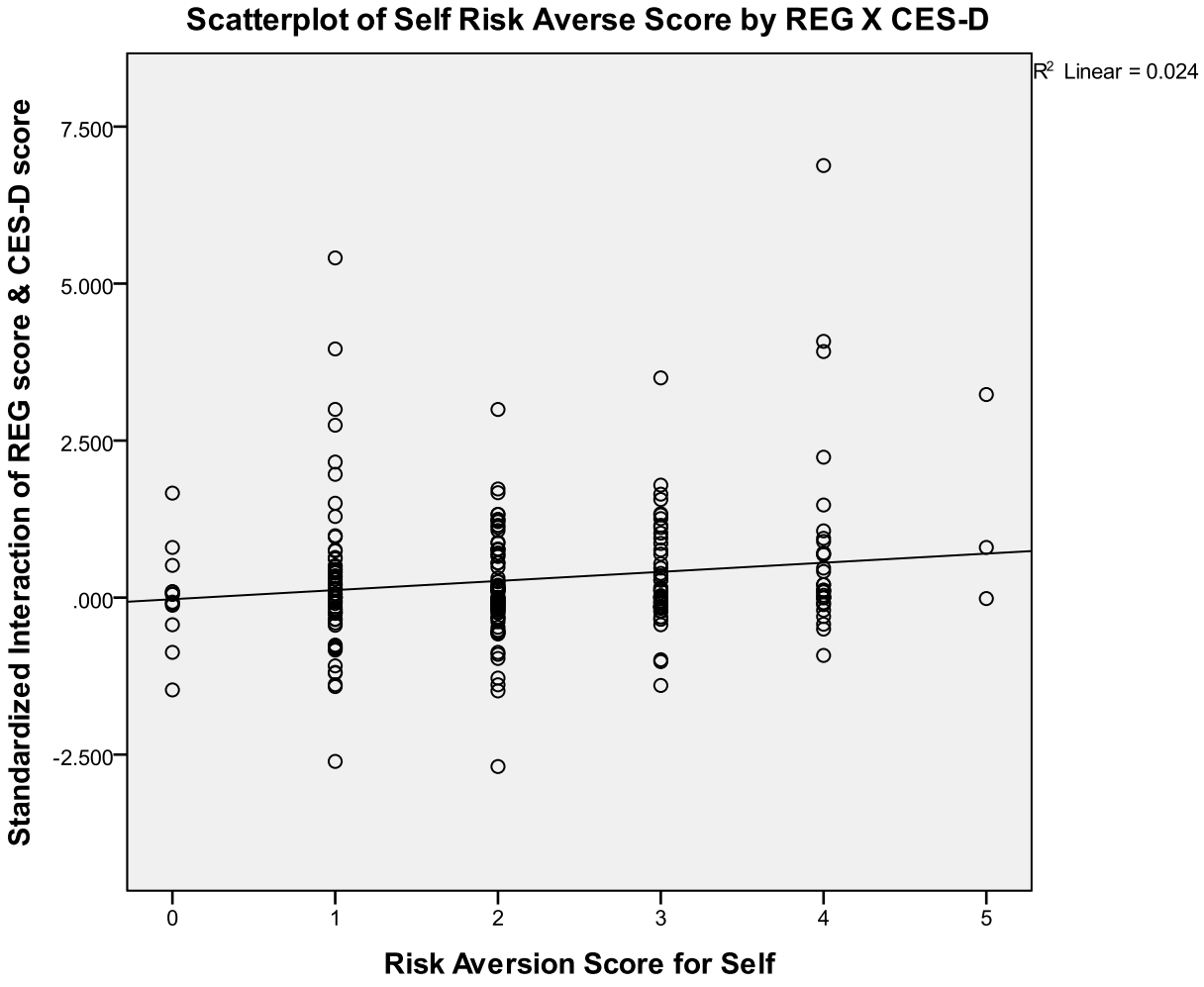
Scatterplot of Self Risk Averse Score by REG X CES-D
R² Linear = 0.024
Standardized Interaction of REG score & CES-D score
7.500
5.000
2.500
.000
-2.500
0
1
2
3
4
5
Risk Aversion Score for Self

Figure 3

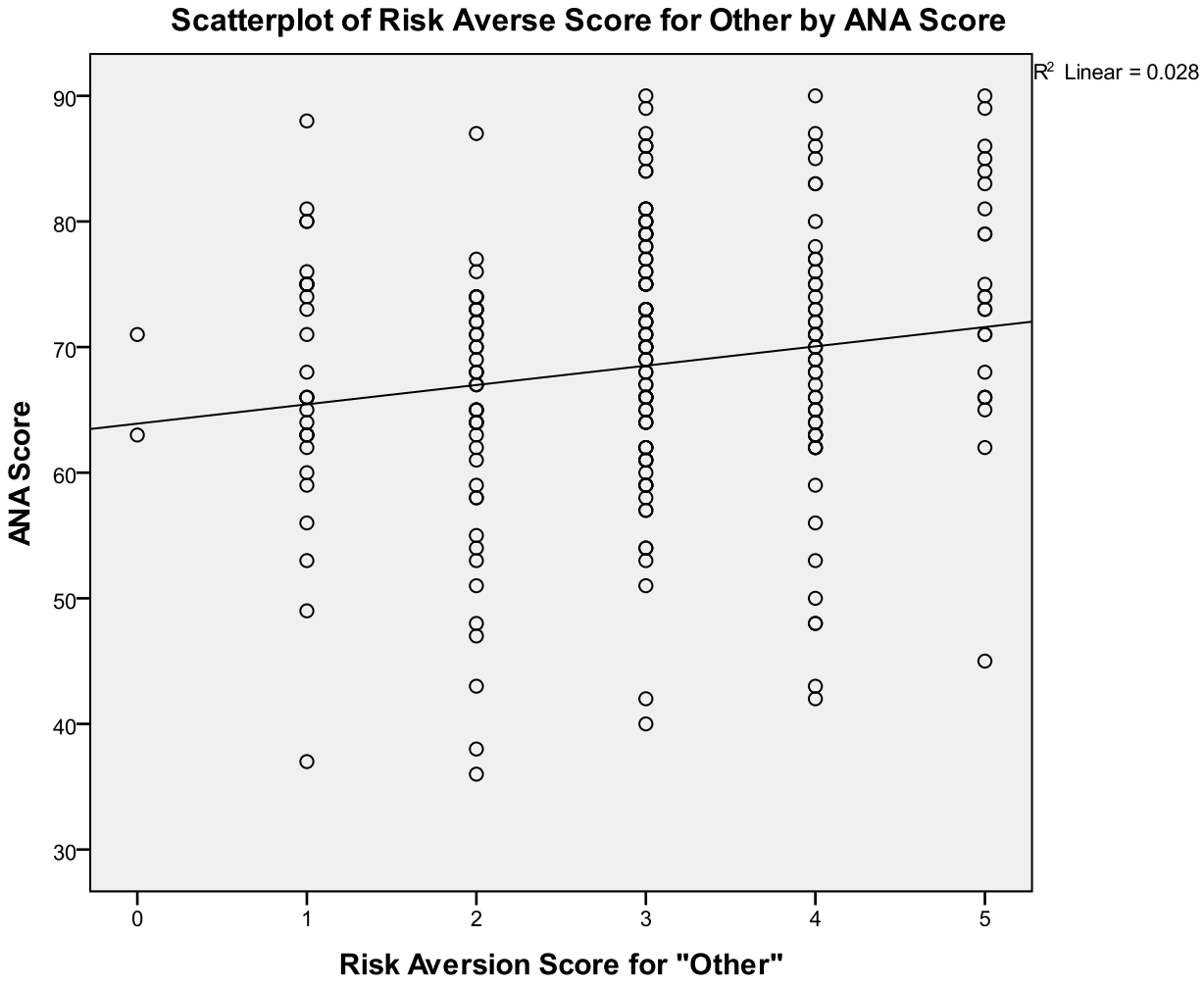
Scatterplot of Risk Averse Score for Other by ANA Score
R² Linear = 0.028
ANA Score
90
80
70
60
50
40
30
0
1
2
3
4
5
Risk Aversion Score for "Other"

Figure 4

Bar Graph of Risk Aversion by Mood

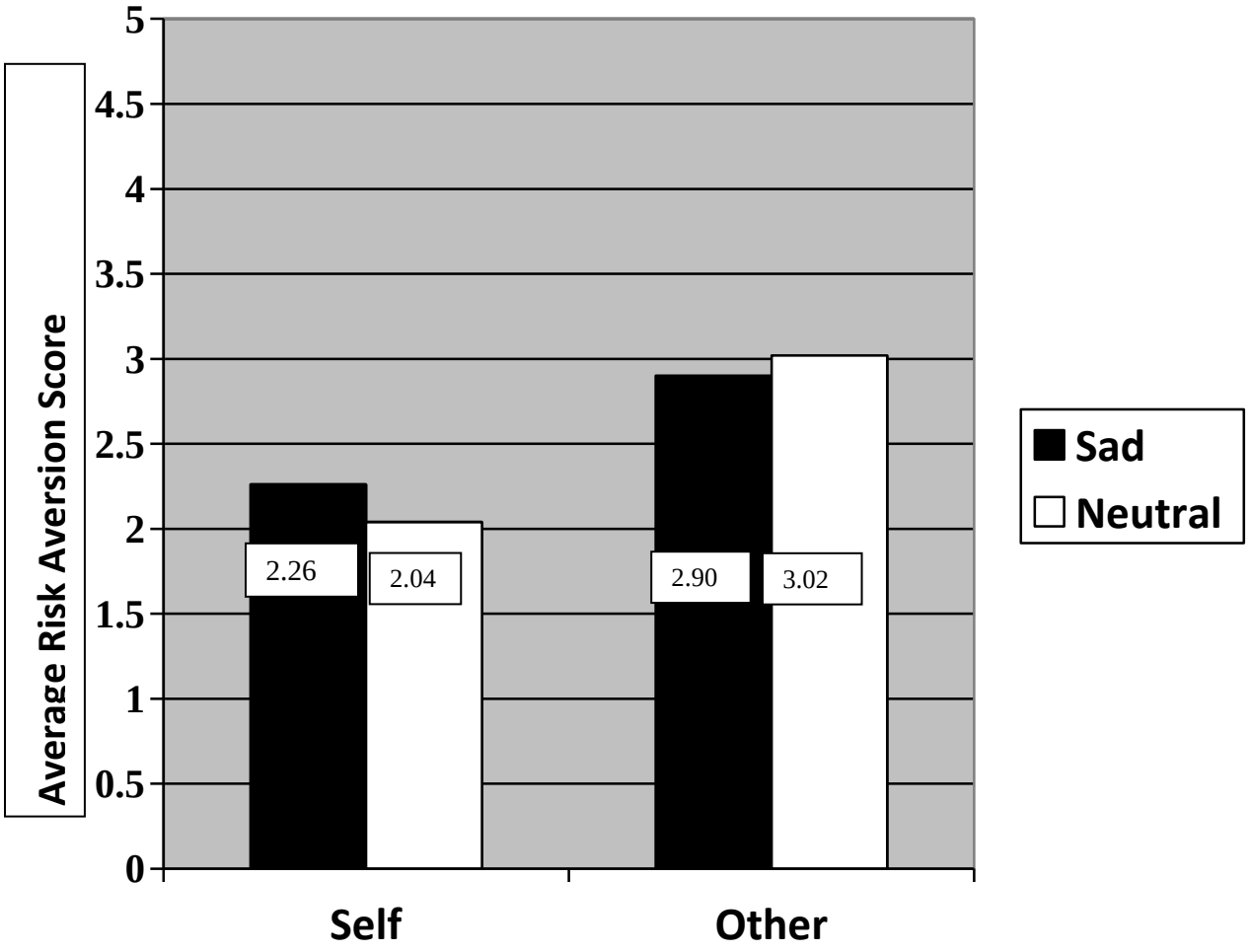

Table 1

Descriptive Statistics of all Variables

	N	Minimum	Maximum	Mean	Std. Deviation
CESD-SCORE	239	0	42	12.96	8.297
ANA(DMI)	240	36	90	68.45	10.568
INT (DMI)	240	23	87	57.57	10.642
REG (DMI)	240	24	88	61.08	12.281
ANA x INT	240	-8.492	3.686	-.20007	1.266248
ANA x REG	240	-4.608	9.271	.25945	1.194206
INT x REG	240	-8.350	5.364	-.35786	1.316804
ANA x CESD	239	-3.632	3.056	-.17716	.976320
INT x CESD	239	-5.477	4.683	-.17707	1.037095
REG x CESD	239	-2.690	6.880	.28442	1.082986
SELF RA SCORE	239	0	5	2.15	1.150
OTHER RA SCORE	239	0	5	2.96	1.162
Age	238	18	40	19.42	2.532
Gender (1= Female)	239	0	1	.57	.496

Table 2: Correlations

		CESD-SCORE	REG (DMI)	ANA(DMI)	INT (DMI)	ANAxINT	ANAxREG	INTxREG	ANAxCESD	INTxCESD	REGxCESD	SELF-RA-SCORE	OTHER-RA-SCORE
CESD-SCORE	Pearson Correlation	-	.285**	-.178**	-.178**	.107	.005	-.042	-.038	-.222**	.193**	.016	-.002
	Sig. (2-tailed)		.000	.006	.006	.099	.942	.517	.561	.001	.003	.801	.970
	N	239	239	239	239	239	239	239	239	239	239	238	238
REG (DMI)	Pearson Correlation	.285**	-	.261**	-.359**	.233**	-.152*	.085	.005	-.054	-.022	.112	.053
	Sig. (2-tailed)	.000		.000	.000	.000	.018	.190	.933	.409	.732	.084	.418
	N	239	240	240	240	240	240	240	239	239	239	239	239
ANA(DMI)	Pearson Correlation	-.178**	.261**	-	-.201**	.112	-.299**	.224**	.025	.130*	.005	.122	.169**
	Sig. (2-tailed)	.006	.000		.002	.082	.000	.000	.702	.044	.934	.060	.009
	N	239	240	240	240	240	240	240	239	239	239	239	239
INT (DMI)	Pearson Correlation	-.178**	-.359**	-.201**	-	-.103	.247**	-.054	.138*	.004	-.050	-.007	-.119
	Sig. (2-tailed)	.006	.000	.002		.111	.000	.405	.033	.952	.438	.919	.066
	N	239	240	240	240	240	240	240	239	239	239	239	239
ANAxINT	Pearson Correlation	.107	.233**	.112	-.103	-	-.554**	.464**	-.087	-.294**	.035	.044	-.004
	Sig. (2-tailed)	.099	.000	.082	.111		.000	.000	.179	.000	.592	.503	.947
	N	239	240	240	240	240	240	240	239	239	239	239	239
ANAxREG	Pearson Correlation	.005	-.152*	-.299**	.247**	-.554**	-	-.488**	.091	.030	-.161*	-.048	-.088
	Sig. (2-tailed)	.942	.018	.000	.000	.000		.000	.159	.649	.013	.458	.175
	N	239	240	240	240	240	240	240	239	239	239	239	239
INTxREG	Pearson Correlation	-.042	.085	.224**	-.054	.464**	-.488**	-	-.057	.163*	-.158*	-.032	.124
	Sig. (2-tailed)	.517	.190	.000	.405	.000	.000		.378	.012	.015	.626	.057
	N	239	240	240	240	240	240	240	239	239	239	239	239
ANAxCESD	Pearson Correlation	-.038	.005	.025	.138*	-.087	.091	-.057	-	-.151*	.259**	.067	-.027
	Sig. (2-tailed)	.561	.933	.702	.033	.179	.159	.378		.019	.000	.307	.684
	N	239	239	239	239	239	239	239	239	239	239	238	238
INTxCESD	Pearson Correlation	-.222**	-.054	.130*	.004	-.294**	.030	.163*	-.151*	-	-.518**	-.072	.076
	Sig. (2-tailed)	.001	.409	.044	.952	.000	.649	.012	.019		.000	.271	.240
	N	239	239	239	239	239	239	239	239	239	239	238	238
REGxCESD	Pearson Correlation	.193**	-.022	.005	-.050	.035	-.161*	-.158*	.259**	-.518**	-	.154*	.056
	Sig. (2-tailed)	.003	.732	.934	.438	.592	.013	.015	.000	.000		.017	.389
	N	239	239	239	239	239	239	239	239	239	239	238	238
SELF-RA-SCORE	Pearson Correlation	.016	.112	.122	-.007	.044	-.048	-.032	.067	-.072	.154*	-	.190**
	Sig. (2-tailed)	.801	.084	.060	.919	.503	.458	.626	.307	.271	.017		.003
	N	238	239	239	239	239	239	239	238	238	238	239	239
OTHER-RA-SCORE	Pearson Correlation	-.002	.053	.169**	-.119	-.004	-.088	.124	-.027	.076	.056	.190**	-
	Sig. (2-tailed)	.970	.418	.009	.066	.947	.175	.057	.684	.240	.389	.003	
	N	238	239	239	239	239	239	239	238	238	238	239	239

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 3

Patterns of Risk Preference by Situation Type and DMI Style

Situation	DMI style (Total= sum of all styles)	# p's both risky	# p's both averse	# p's risky self/ averse other	#p's averse self/ risky other	McNemar's p-value
Gamble	ANA	13	86	14	24	.143
Gamble	INT	9	16	4	11	.118
Gamble	REG	12	32	4	12	.359
Gamble	TOTAL	34	134	25	47	.013*
Date	ANA	40	30	36	31	.625
Date	INT	17	5	9	9	1.00
Date	REG	16	10	16	21	.511
Date	TOTAL	73	45	61	61	1.00
Job	ANA	47	39	40	11	.000**
Job	INT	11	16	10	3	.092**
Job	REG	18	23	18	4	.004**
Job	TOTAL	76	78	68	18	.000**
School	ANA	62	13	56	6	.000**
School	INT	22	3	12	3	.035*
School	REG	31	11	18	3	.001*
School	TOTAL	115	27	86	12	.000**
Traffic	ANA	24	58	53	2	.000**
Traffic	INT	12	9	15	4	.019*
Traffic	REG	11	22	29	1	.000**
Traffic	TOTAL	47	89	97	7	.000**

* p-value is significant at $\alpha = .05$

**p-value is significant at $\alpha = .01$

Appendix A

CES-D

Circle the number for each statement which best describes how often you felt or behaved this way – DURING THE PAST WEEK**.**

	Rarely or none of the time (less than 1 day)	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of the time (3-4 days)**	**Most or all of the time (5-7 days)**
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4. I felt that I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the future.	0	1	2	3
9. I thought my life had been a failure	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
	0	1	2	3

13. I talked less than usual.				
	Rarely or none of the time (less than 1 day)	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of the time (3-4 days)**	**Most or all of the time (5-7 days)**
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3
18. I felt sad.	0	1	2	3
19. I felt that people disliked me.	0	1	2	3
20. I could not get going.	0	1	2	3

Appendix B

Decision Making Inventory 16P-55 (REVISED)

We are interested in how you typically go about making decisions. Think about different situations and contexts where you have made decisions recently. Then for each statement below, indicate the degree to which you agree or disagree with that statement. Keep in mind that there are no right or wrong answers to any of these items, because there is no single "best" way to make every decision. It is important that you try to answer all questions. However, if you feel uncomfortable with any item, you may choose to omit it. Use the following rating scale for each statement.

1	**2**	**3**	**4**	**5**	**6**
Strongly Disagree	**Moderately Disagree**	**Slightly Disagree**	**Slightly Agree**	**Moderately Agree**	**Strongly Agree**

1 ____ I feel that if I plan my decisions carefully I will make good decisions.

2 ____ In spontaneous decision situations I usually find that I have good intuitions.

3 ____ I think that I could keep myself from worrying later if I had made a bad decision.

4 ____ In making decisions I first try to make a mental list of all the factors or attributes that will be important to my decision

5____ I can get a good "feeling" for most decision situations very quickly.

6 ____ I sometimes spend too much time hesitating before making decisions.

7 ____ Before I make a decision, I like to figure out the most efficient way of studying it.

8 ____ I feel that I have a knack for making good, quick decisions.

9 ____ I tend to remember bad decisions I've made.

10____ I'm very rational when it comes to evaluating risky options.

11____ I think that relying on one's "gut feelings" is a sound decision making principle.

12 ____ I tend to be someone who worries a lot over decisions I've made.

13____ In making decisions I first make a careful initial estimate of the situation.

14 ____ A quick, intuitive decision rule usually works best for me.

15 ____ After making a decision, I find that I often go back and re-evaluate the situation.

16____ I try to pay attention to past information in making new decisions.

17____ Sometimes decisions, even important ones, are not difficult to make because they just "feel" right.

18____ I have trouble putting the results of disappointing decisions I've made behind me.

19____ A good rule of thumb is that the more information I have in making a decision, the better that decision will be.

20 ____ Simple decision rules usually work best for me.

21____ I rarely rethink old decisions I've made.

22____ In making decisions I try to evaluate the importance of each piece of information in the decision process.

23____ When forced to make a quick decision, I find that information that readily comes to mind is usually the most useful in making a choice.

1	2	3	4	5	6
Strongly	**Moderately**	**Slightly**	**Slightly**	**Moderately**	**Strongly**
Disagree	**Disagree**	**Disagree**	**Agree**	**Agree**	**Agree**

24____ Worrying about future decisions that I have to make is something I often do.

25____ I always try to be fully prepared before I begin working on making a decision.

26____ My first reaction to a decision situation usually turns out to be the best one.

27____ Many times when I look back on a choice I've made, I wish that I would have put more effort into evaluating the alternatives

28____ In making decisions I try to examine the importance of the good and bad points of each alternative.

29____ I make my best choices when I have to make quick, instinctive decisions.

30____ When I find out that I've made a bad decision I feel a lot of regret.

31____ I like to take a rational, systematic approach to making decisions.

32____ When making decisions, my first instinct usually turns out to be best.

33____ Before I make a decision, I think about whether I might regret it later.

34____ My best decisions are those for which I've carefully weighed all of the relevant information.

35____ I let my intuition play a big part in most decisions I make.

36____ I generally don't make very good decisions under time pressure.

37____ I generally rely on careful reasoning in making up my mind.

38____ I often rely on my first impression when making a decision.

39____ I sometimes get "butterflies" in my stomach when I have to make decisions.

40____ I like to make decisions in an orderly manner.

41____ I rely on my intuition in making many of my personal decisions.

42____ After making a decision I sometimes worry about the regret I'll feel if it the outcome turns out to be a bad one.

43____ Most important decisions in life are complex and need to be evaluated in a systematic way.

44____ I find that my best decisions usually result from using the "quick and easy" approach rather than the "slow but sure" method.

45____ Unexpected bad outcomes have a greater impact on me than do unexpected good outcomes.

Appendix C

PART II: EMPATHY WITH HYPOTHETICAL SITUATION

The purpose of this task is to investigate your ability to put yourself in a hypothetical situation and empathize with it.

On the next page, you will read five short passages about an episode that is supposed to have happened recently in your life. As you read the passages, try to experience the event as vividly as possible by imagining what it would feel like to be in that situation. We are interested in assessing how successful you are at empathizing with the situation.

In order to fully empathize with a situation, it is important that you don't get distracted. Therefore, we request that you focus completely on the task at hand and refrain from talking to or interacting with the person sitting next to you. We also request you to avoid making any noise (not even a sigh!) that may disturb others.

Please read the passages slowly and carefully.

We thank you for your co-operation.

HYPOTHETICAL SITUATION (NEUTRAL)

1. I ran into Pat, an old acquaintance of mine, the other day. This happened at the mall. To tell you the truth, I did not realize that it was Pat for a long time. It did look like the Pat I knew from behind (especially the slouch), but I couldn't be sure. It was only when Pat started walking that I realized it couldn't be anyone but Pat. Pat had this characteristic way of walking without really lifting the legs that was kind of a "trademark" Pat walk.

2. Since Pat and I hadn't seen each other in a long time, we wanted to catch up on each other's lives and decided to meet at a local bar. I was looking forward to the meeting since I wanted to find out what Pat had been up to in all these years. I arrived about 10 minutes late and Pat was already there. The bar was very crowded and the music was really loud. We could hardly hear each other talk! I decided that I would have to do my "catching up" act another time.

3. We continued sitting in the bar, listening to music for a while. A little later, we ran into one of our mutual friends from school - Alex - at the bar. For some odd reason, the music also became softer once Alex arrived. Someone must have reduced the volume. Alex, Pat and I always used to hang out together and we reminisced about the times we spent together. We talked about anything and everything that came to our minds, including the TAs and our professors. I was trying to figure out the ways in which Pat and Alex had changed and I am sure they were trying to "figure" me out as well.

4. Later, the three of us left the bar to go see a movie and ran into another friend of ours from school - Yerah! The four of us talked about how bizarre the whole thing was – that we should all meet after such a long time. As it turned out, Yerah was with a group of friends who also wanted to see the movie we wanted to see. The movie (whose name I forget now) was "so-so", but had a interesting theme -- it was about four friends meeting after a long time.

5. After the movie, Alex, Pat and I went out for some coffee at the local coffee-shop. Alex had an early appointment next day and had to leave shortly. But Pat and I continued chatting for a while and then decided to go home and catch some sleep since it was getting so late. As we parted, we promised to meet again sometime soon.

HYPOTHETICAL SITUATION (SAD)

1. It is nearing the end of the spring semester and you are really looking forward to the summer break. The semester has been a little hectic, and you are happy that you will have some time relaxing with your family. The Sunday two weeks before finals week you get up early to catch up on your courses. You are in the shower thinking about what you will study when your roommate pulls you out of the shower, telling you you have a phone call from you sibling. The minute you talk to your sister (brother) you know by her (his) strained voice that something is wrong. She (he) tell you that your mom is sick in the hospital, and that they don't know what it is. Without finding out more you say you'll fly back there immediately.

2. The flight home is confusing, and you feel dizzy in trying to come to some understanding of what is happening. You constantly reassure yourself that your mom is OK and that it is nothing serious. Funnily, it seems as though people on the plane sense your distress and act sympathetically toward you.

3. Upon arrival you quickly take a cab to the hospital and once there you find your mom's room. Upon entering your mom's room, you see the rest of your family there with their pale drained faces and teary eyes. They are huddled around your mom, who looks weakened and frail, with yellowed skin. You are overwhelmed by how much you love your mom and how pained she looks.

4. You go to your mom's bed and kneed beside her, hold her legs. Her face rocks semi-consciously, flinching from time to time, and sometimes whimpering at the pain in her body. She looks up at you and the rest of the family, seeming to cry and smile at the same time. She raises her arms a little under the sheets as if to reach out to you and says "you're all here". "Of course we are" you reply and then she says, somewhat hesitantly, "It is sort of strange being in this place, isn't it?"

5. You all reassure her that she'll be all right, but she closes her eyes and tells you that she feels like she is spinning around. She then closes her eyes and dies.

EMPATHY INVENTORY

Please indicate how well you were able to empathize with the hypothetical situation you just read:

	Strongly Agree						Strongly Disagree
I could relate to the episode I just read.	1	2	3	4	5	6	7
I was able to imagine the episode very vividly.	1	2	3	4	5	6	7
I felt myself getting emotional as I read the passage.	1	2	3	4	5	6	7
I feel the issue the passage dealt with was not realistic.	1	2	3	4	5	6	7
I feel the issue the passage dealt with was relevant to me.	1	2	3	4	5	6	7
I would have reacted similarly in the same situation.	1	2	3	4	5	6	7

Appendix D

CONSUMER DECISION MAKING QUESTIONNAIRE

In this questionnaire, we are interested in testing how people make decisions and choices. In the following pages, you will be asked to make some decisions and choices.

Please read each of the situations and answer the questions that follow:

GAMBLE SITUATION PART A

Supposing you are asked to choose between the following two gambles:

Gamble A	**Gamble B**
6/10 chance of winning **$ 5**	**3/10** chance of winning **$10**

1. Indicate which of these two gambles you feel is more attractive (circle the number that best represents your preference):

I find Gamble A more attractive					I find Gamble B more attractive
1	2	3	4	5	6

GAMBLE SITUATION PART B

2. If you were asked to choose one of them (to play), which one would it be (check one)?

Gamble A _____

Gamble B _____

GAMBLE SITUATION PART C

3. Suppose you are then asked to choose between the two gambles for another person, and note that the results of the gamble will not personally affect you in anyway. You do not know this other person. Which gamble would you choose (check one)? :

Gamble A _____

Gamble B _____

JOB SITUATION PART A

Supposing you are asked to choose between the following two job opportunities (assume each is a position you would actually seek and are the same type of job but with different companies):

Job A

Job A is a position in the field in which you received your degree. While this position offers a salary near the top of the expected range, it is with a newly formed company and thus can offer only minimal job security.

Job B

Job B is a position in the field in which you received your degree. While this position offers a salary near the bottom of the expected range, it is with an established company, and thus can offer high job security.

1. Indicate which of these two jobs you feel is more attractive (circle the number that best represents your preference):

I find Job A more attractive					I find Job B more attractive
1	2	3	4	5	6

JOB SITUATION PART B

2. If you were asked to choose one of them (to accept), which one would it be (check one)?

Job A _____

Job B _____

JOB SITUATION PART C

3. Suppose you are then asked to choose between the two jobs for another person, and note that the results of the choice will not personally affect you in anyway. You do not know this other person. Which job would you choose (check one)?:

Job A _____

Job B _____

SCHOOL SITUATION PART A

Supposing you are asked to choose between the following two undergraduate programs (assume each is a school to which you have applied and been accepted):

School A

School A offers the major that you are interested in, and has a reputation for graduating exceptionally qualified professionals who easily get top jobs in your field. However, the major program is highly competitive, and approximately 30% of students who apply to the program are accepted into it.

School B

School B offers the major that you are interested in, and has a reputation for graduating somewhat qualified professionals, who find entry-level positions in your field, or a related field. However the major program is non-competitive and 100% students who apply to the program are accepted.

1. Indicate which of these two schools you feel is more attractive (circle the number that best represents your preference):

I find School A more attractive					I find School B more attractive
1	2	3	4	5	6

SCHOOL SITUATION PART B

2. If you were asked to choose one of them (to attend), which one would it be (check one)?

School A _____

School B _____

SCHOOL SITUATION PART C

3. Suppose you are then asked to choose between the two schools for another person, and note that the results of the choice will not personally affect you in anyway. You do not know this other person. Which school would you choose (check one)?:

School A _____

School B _____

TRAFFIC SITUATION PART A

Supposing you are asked to choose between the following actions when approaching a yellow light while on your way to an important meeting, for which you are nearly late:

Action A

You can speed up and try to get through the light before it changes. Although this intersection is sometimes the scene of accidents, making it through the light means that you will be on time to the meeting. You know that being on time is fairly important to your boss.

Action B

You can slow down and get to the intersection at a red light. Although this intersection has a long light and slowing down guarantees you will be at least three minutes late to the meeting, it also means there is no chance you will be involved in any accident. You know that being on time is fairly important to your boss, but think he'll understand.

1. Indicate which of these two actions you feel is more attractive (circle the number that best represents your preference):

I find Action A more attractive					I find Action B more attractive
1	2	3	4	5	6

TRAFFIC SITUATION PART B

2. If you were asked to choose one of them (to take), which one would it be (check one)?

Action A _____

Action B _____

TRAFFIC SITUATION PART C

3. Suppose you are then asked to choose between the two actions for another person, and note that the results of the choice will not personally affect you in anyway. You do not know this other person. Which action would you choose (check one)?:

Action A _____

Action B _____

DATE SITUATION PART A

Supposing you need to choose between the following two potential dates to a formal dance (assume you may only ask one no matter her (his) answer):

Potential Date A

You have had many classes with potential date A, and would consider her (him) a friend. You have heard from other friends of hers (his) that she (he) would definitely say yes to you if you asked her (him) to the dance. However, you wouldn't like to develop a romantic relationship with potential date A because although you are confident she (he) is attracted to you, you don't feel you have much in common aside from classes.

Potential Date B

You have not had many classes with potential date B, and would consider her (him) an acquaintance that you would like to get to know better. You have heard from other friends of hers (his) that some other guys (girls) are planning on asking her (him) to the dance, and she (he) doesn't know who she'd (he'd) like to go with. You would really like to develop a romantic relationship with potential date B, because you think you have a lot in common, but you can't tell how she (he) feels.

1. Indicate which of these two potential dates you find more attractive (not physically, but which you would prefer to ask) (circle the number that best represents your preference):

I find Potential Date A more attractive					I find Potential Date B more attractive
1	2	3	4	5	6

DATE SITUATION PART B

2. If you were asked to choose one of them (to ask), which one would it be (check one)?

Potential Date A _____

Potential Date B _____

DATE SITUATION PART C

3. Suppose you are then asked to choose between the two potential dates for another person, and note that the results of the choice will not personally affect you in anyway. You do not know this other person. Which potential date would you choose (check one)?:

Potential Date A _____

Potential Date B _____